REMARKS

In the Office Action mailed June 9, 2004, the Examiner noted that claims 1-5 were pending, and rejected claims 1-5. Claims 1 and 4 have been amended, new claim 6 has been added and, thus, in view of the forgoing claims 1-6 remain pending for reconsideration which is requested. No new matter has been added. The Examiner's rejections are traversed below.

On page 2 of the Action in block 12 concerning receipt of priority documents, the Examiner asserted that the certified copy of the priority document had not been received. Attached is a copy of a stamped return receipt postcard showing that the priority document was received. Also attached is a copy of the cover sheet of the priority document and the certification page attached to the priority document on the front. The Examiner is requested to confirm that the certified copy of the priority document was received.

In the Office Action the Examiner rejected claims 1 and 2 under 35 U.S.C. section 112 paragraph 2 as indefinite. Claim 1 has been amended in consideration of the Examiner's comments and it is submitted it satisfies the requirements of the statute. Claim 2 is submitted to be related to the previously recited claim elements of claim 1 through the two dimensional Fourier transform recitations and, thus, is not indefinite. If additional concerns with the claims arise, the Examiner is invited to telephone to resolve the same. Suggestions by the Examiner are also welcome. Withdrawal of the rejection is requested.

On page 2 of the Office Action, the Examiner rejected all claims under 35 U.S.C. § 102 as anticipated by Hegland.

First, Hegland is concerned with performing a Fourier transform (a Fast Fourier Transform - FFT) on complex numbers where each number has a real part and an imaginary part. Thus, Hegland is limited to two dimensions and is attempting to perform such a complex number transform efficiently.

The present invention is attempting to solve a different and more complex problem. The present invention is designed to perform Fourier transforms on multidimensional data where the data has three or more dimensions ("a plurality of two-dimensional data elements" & " remaining dimensions of the multi-dimensional data" - see claims 1, 4 and 5). Hegland does not teach or suggest how to perform Fourier transforms of multi-dimensional data where three or more dimensions are involved.

Hegland (see col. 4, lines 59+) also is directed to performing the transform in memory distributed type parallel computers. In such a system, the data is divided into parts (subarrays),

the subarrays are distributed to the computers and operations are performed in parallel using the subarrays. As the FFT proceeds data must be transferred between the processors to complete the transform. That is, data necessary to complete the transform does not reside in any one processors memory.

In contrast, the present invention improves the efficiency of processing the two dimensional Fourier transform by storing the two dimensional data elements in the memory until the two dimensional Fourier transform is complete or "finished" (see claims 1, 4 and 5). That is, the data needed is available and need not be obtained from another processor as in Hegland.

Computers contain several different types of memory, disk memory, main memory, secondary cache memory and primary cache memory among the types and data is typically transferred between these different types of memory as operations by the processor proceed. To further improve the efficiency of the multi-dimensional transform, the present invention places the data being transformed in the "cache" memory (see claims 1, 4 and 5). Hegland does not discuss much less mention such an arrangement.

It is submitted that the present claimed invention patentably distinguishes over Hegland and withdrawal of the rejection is requested.

The dependent claims depend from the above-discussed independent claims and are patentable over the prior art for the reasons discussed above. The dependent claims also recite additional features not taught or suggested by the prior art. For example, claim 2 calls for binding data and transferring the data from secondary cache to primary cache for processing. As noted above Hegland says nothing about manipulating data in the caches of the processor. It is submitted that the dependent claims are independently patentable over the prior art.

New claim 6 emphasizes that data is divided along a third data dimension corresponding to processor threads, the processors two dimensionally Fourier transform the data, and then the transform in the third dimensional direction is performed using the data in shared memory. Hegland does not teach or address such. Nothing in the prior art teaches or suggests such. It is submitted that the new claim distinguishes over the prior art.

It is submitted that the claims satisfy the requirements of 35 U.S.C. 112. It is further submitted that the claims are not taught, disclosed or suggested by the prior art. The claims are therefore in a condition suitable for allowance. An early Notice of Allowance is requested.

If any further fees, other than and except for the issue fee, are necessary with respect to this paper, the U.S.P.T.O. is requested to obtain the same from deposit account number 19-3935.

Respectfully submitted,

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